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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Global IP Services PLLC
198F 27th Cross 3rd Block Jayanagar
Bangalore, 560011
INDIA

EXAMINER	
SAINT CYR, LEONARD	

ART UNIT	PAPER NUMBER
2626	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/774,211	PRAKASH ET AL.	
	Examiner	Art Unit	
	LEONARD SAINT CYR	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 2, 4-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/09/08 has been entered.

Response to Arguments

2. Applicant's arguments filed 07/09/08 have been fully considered but they are not persuasive.

Applicant argues that Liu et al., does not teach determining whether the quantization step sizes in one or more scale factor bands are at a vanishing point, wherein the vanish point is a point at which any increase in the quantization step size can result in a quantized value of zero; freezing the quantization step sizes in all the scale factor bands which are at vanishing point and exiting the quantization of the current frame when the number of bits consumed is at or below the specified bit rate (Amendment, page 11).

The examiner disagrees, Liu et al., teach "the noise higher than the masking threshold leads to a phenomenon that the associated band will be rounded to zero,

referred to as the zero bands. The zero bands are quite perceptually noticeable. So, the quantization levels should also be restricted to be no longer than the signal energy" (paragraph 48, last six lines). Restricting quantization levels in the zero bands to be no longer than the signal energy implies freezing the quantization step sizes in all the scale factor bands which are at vanishing point, since zero bands are bands where quantization levels are around zero. Liu et al., further disclose "checking if a prescribed number of bits available is enough or not for the encoded data. If the number of bits available is not greater than the overall length of the encoded data, a parameter adjustment is made and the quantization step size is increased" (paragraph 28, lines 2 – 6). Increasing the quantization step size if the number of bits available is not enough implies exiting the quantization of the current frame when the number of bits consumed is at or below the specified bit rate, since quantization is stopped or exited if the number of bits available is greater than the overall length of the encoded data.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 2, 4 – 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu et al., (US PAP 2004/0002859).

As per claim 1, Liu et al., teach a method for quantizing an audio signal, the method comprising:

iteratively incrementing a quantization step size of each scale factor band of a current frame ("an iterative rate control loop adjust the ...the quantization step size"; Abstract, lines 8 – 11);

comparing a number of bits consumed in quantizing spectral lines in scale factor bands in the current frame to a specified bit rate ("compares a prescribed number"; paragraph 30, lines 14 – 19);

determining whether the quantization step sizes in one or more scale factor bands are at a vanishing point, wherein the vanish point is a point at which any increase in the quantization step size can result in a quantized value of zero ("a phenomenon that the associated band will be rounded to zero, referred to as the zero bands" paragraph 48, last six lines); and

freezing the quantization step sizes in all the scale factor bands which are at vanishing point and exiting the quantization of the current frame when the number of bits consumed is at or below the specified bit rate ("checking if a prescribed number of bits available is enough or not for the encoded data. If the number of bits available is not greater than the overall length of the encoded data, a parameter adjustment is made and the quantization step size is increased"; paragraph 28, lines 2 – 6).

As per claim 2, Liu et al., further disclose grouping sets of spectral lines to form the scale factor bands in the current frame ("number of lines grouped in quantization band"; paragraph 4, lines 1 – 4);

assigning an initial quantization step size to each scale factor band in the current frame; and quantizing the sets of spectral lines in each scale factor band ('the quantization step size may also be adjusted"; paragraph 29, lines 9, and 10).

As per claim 3, Liu et al., further disclose that the vanishing point comprises: a quantized value of substantially close to value of `0` ("quantization bands must be zero"; paragraph 66).

As per claims 4, and 12, Liu et al., teach quantizing an audio signal comprising:

determining whether a number of bits consumed in quantizing spectral lines in scale factor bands in a current frame is at or below a user specified bit rate ("compares a prescribed number"; paragraph 30, lines 14 – 19; paragraph 28, lines 6 – 8);

if so, freezing the quantization step sizes in all the scale factor bands and exiting the quantization of the current frame ("the number of required bits for the encoding reaches the number of bits available"; paragraph 28, lines 6 – 8);

if not, incrementing quantization step size of each scale factor band by a predetermined quantization step size ("an iterative rate control loop adjust the ...the quantization step size"; Abstract, lines 8 – 11);

determining whether the quantization step sizes in one or more scale factor bands are at a vanishing point, wherein the vanish point is a point at which any increase in the quantization step size can result in a quantized value of zero ("a phenomenon

that the associated band will be rounded to zero, referred to as the zero bands" paragraph 48, last six lines); and

if not, repeating the above steps ('the quantization step size is increased ... The process is repeated"; paragraph 28, lines 5 –8).

As per claims 5, and 13, Liu et al., further disclose if so, freezing the quantization step sizes of the one or more scale factor bands that are at the vanishing point (paragraph 28, lines 5 – 8; paragraph 66);

quantizing the spectral lines of remaining scale factor bands that are not at the vanishing point ("number of lines grouped in quantization band"; paragraph 4, lines 1 – 4);

determining whether number of bits consumed in the remaining scale factor bands is at or below the user specified bit rate ("compares a prescribed number"; paragraph 30, lines 14 – 19);

if so, freezing the quantization step sizes in all the remaining scale factor bands and exiting the quantization of the current frame; if not, incrementing quantization step size of each remaining scale factor band by the predetermined quantization step size ("this process is repeated until the number required bits ...reaches the number of bits available"; paragraph 28, lines 5 – 8);

determining whether the quantization step sizes in one or more of the remaining scale factor bands are at the vanishing point ("quantization bands must be zero"; paragraph 66); and

if not, repeating the above steps('the quantization step size is increased … The process is repeated"; paragraph 28, lines 5 –8).

As per claim 6, Liu et al., further disclose if so, comparing the remaining scale factor bands with a perceptual priority chart; dropping one or more of the remaining scale factor bands as a function of the comparison ("adjusting the parameters values to fit to a perceptual criterion"; paragraph 7, lines 9 – 11);

determining whether number of bits consumed by the remaining scale factor bands is at or below the user specified bit rate in the current frame("compares a prescribed number"; paragraph 30, lines 14 – 19);

if so, freezing the quantization step sizes in all the remaining scale factor bands which are at vanishing point; and if not, repeating the above steps and dropping one or more additional scale factor bands as a function of the comparison until the number of bits consumed by the remaining scale factor bands is at or below the user specified bit rate ("this process is repeated until the number required bits …reaches the number of bits available"; paragraph 28, lines 5 – 8).

As per claim 7, Liu et al., further disclose grouping sets of spectral lines to form the scale factor bands in the current frame ("number of lines grouped in quantization band"; paragraph 4, lines 1 – 4);

assigning an initial quantization step size to each scale factor band in the current frame; and quantizing the sets of spectral lines in each scale factor band ('the quantization step size may also be adjusted"; paragraph 29, lines 9, and 10).

As per claim 8, Liu et al., further disclose that the vanishing point comprises: a quantized value of substantially close to value of `0`("quantization bands must be zero"; paragraph 66).

As per claim 9, Liu et al., teach a method for quantizing spectral information in an audio encoder comprising:

assigning an initial quantization step size to each scale factor band in a current frame as a function of a priority chart generated based on a perceptual model; forming a first perceptual priority chart for the assigned scale factor bands ("'adjusting the parameters values to fit to a perceptual criterion"; paragraph 29, lines 9, and 10; paragraph 7, lines 9 – 11);

determining whether number of bits consumed in quantizing spectral lines in scale factor bands in a current frame is at or below a user specified bit rate ("compares a prescribed number"; paragraph 30, lines 14 – 19);

if so, freezing the quantization step sizes in all the scale factor bands and exiting the quantization of the current frame; if not, incrementing quantization step size of each scale factor band based on the first perceptual priority chart ("this process is repeated

until the number required bits ...reaches the number of bits available"; paragraph 28, lines 5 – 8);

determining whether the quantization step sizes in one or more scale factor bands are at a vanishing point, wherein the vanish point is a point at which any increase in the quantization step size can result in a quantized value of zero ("a phenomenon that the associated band will be rounded to zero, referred to as the zero bands" paragraph 48, last six lines); and

if not, repeating the above steps ("this process is repeated"; paragraph 28, lines 5 – 8).

As per claim 10, Liu et al., further if so, freezing the quantization step sizes of the one or more scale factor bands that are at the vanishing point ("until the number of required bits ...reaches the number of bits"; paragraph 66; paragraph 28, lines 5 – 8);

forming a second perceptual priority chart by removing the one or more scale factor bands that are at the vanishing point from the first perceptual priority chart ("adjusting the parameters values to fit to a perceptual criterion implies forming a second perceptual priority chart"; paragraph 29, lines 9, and 10; paragraph 7, lines 9 – 11);

quantizing spectral lines of remaining scale factor bands that are not at the vanishing point ("number of lines grouped in quantization band"; paragraph 4, lines 1 – 4);

determining whether number of bits consumed in the remaining scale factor bands is at or below the user specified bit rate ("compares a prescribed number"; paragraph 30, lines 14 – 19);

if so, freezing the quantization step sizes in all the remaining scale factor bands and exiting the quantization of the current frame; if not, incrementing quantization step size of each remaining scale factor band based on the second perceptual priority chart("this process is repeated until the number required bits …reaches the number of bits available"; paragraph 28, lines 5 – 8);

determining whether all the remaining scale factor bands are at the vanishing point ("quantization bands must be zero"; paragraph 66); and

if not, repeating the above steps ("this process is repeated"; paragraph 28, lines 5 – 8).

As per claims 11, and 14, Liu et al., further disclose if so, comparing the remaining scale factor bands with the first perceptual priority chart; dropping one or more of the remaining scale factor bands having lower perceptual priority as a function of the comparison ("adjusting the parameters values to fit to a perceptual criterion"; paragraph 7, lines 9 –11)

determining whether number of bits consumed by the remaining scale factor bands is at or below the user specified bit rate in the current frame("compares a prescribed number"; paragraph 30, lines 14 – 19);

if so, freezing the quantization step sizes of all the remaining scale factor bands; and if not, repeating the above steps and dropping one or more additional scale factor bands as a function of the comparison until the number of bits consumed by the remaining scale factor bands is at or below the user specified bit rate chart ("this process is repeated until the number required bits ...reaches the number of bits available"; paragraph 28, lines 5 – 8).

As per claims 15, 18, and 21, Liu et al., teach an audio coder comprising:

an input module partitions an audio signal into a sequence of successive frames ("bands"; paragraph 4, lines 1 – 3);

a time-to-frequency transformation module obtains the spectral lines in each frame and forms critical bands by grouping sets of neighboring spectral lines (paragraph 3, line 3); and

an encoder coupled to the time-to-frequency module, wherein the encoder further comprises:

an inner loop module determines whether number of bits consumed is at or below a user specified bit rate in a current frame, wherein the inner loop module freezes quantization step sizes in all the critical bands when the number of bits consumed is at or below the user specified bit rate ("the process is repeated"; paragraph 28, lines 5 – 8); and

an outer loop module increments quantization step sizes of each critical band by a predetermined quantization step size when the number of bits consumed is above the

user specified bit rate, and wherein the outer loop module increments quantization step sizes and determines whether quantization step sizes in one or more critical bands are at the vanishing point, wherein the vanishing point is a point at which any increase in the quantization step size can result in a quantized value of zero ("a phenomenon that the associated band will be rounded to zero, referred to as the zero bands"), and wherein the outer loop module freezes the quantization step sizes of the one or more critical bands that are at the vanishing point ("two nested loop"; paragraph 66; paragraph 29, lines 9 – 10; paragraph 28, lines 5 – 8; paragraph 77, lines 9, and 10; paragraph 48, last six lines).

As per claims 16, and 19, Liu et al., further disclose that the outer loop module quantizes spectral lines of remaining critical bands that are not at the vanishing point, wherein the inner loop module determines whether number of bits consumed by the critical bands is at or below the user specified bit rate, wherein the outer loop module freezes the quantization step sizes in all the remaining critical bands and exits quantization of the current frame, wherein the outer loop module increments quantization step sizes of the remaining critical bands by the predetermined quantization step size, wherein the outer loop module determines whether the remaining critical bands are at the vanishing point, and wherein the outer loop module increments quantization step sizes until the user specified bit rate is met when none of the remaining critical bands are not at the vanishing point ("a parameter adjustment is

made and the quantization step size is increased"; paragraph 66; paragraph 29, lines 9 – 10; paragraph 28, lines 5 – 8; paragraph 77, lines 9, and 10).

As per claim 17, and 20, Liu et al., further disclose that the outer loop module compares the remaining critical bands with a perceptual priority chart when all the critical bands are at the vanishing point, wherein the outer loop module drops the one or more of the critical bands having a lower perceptual quality as a function of the comparison, wherein the inner loop module determines whether number of bits consumed by the spectral lines in the remaining critical bands is at or below the user specified bit rate in the current frame, wherein the outer loop module freezes the quantization step sizes of all the remaining critical bands when the number of bits consumed by the remaining critical bands is at or below the user specified bit rate, and wherein the outer loop module drops one or more critical bands until the user specified bit rate is met when the number of bits consumed by the remaining critical bands are above the user specified bit rate ("adjusting the parameters values to fit to a perceptual criterion"; paragraph 66; paragraph 29, lines 9 – 10; paragraph 28, lines 5 – 8; paragraph 77, lines 9, and 10; paragraph 7, lines 9 - 11).

As per claim 22, Liu et al., further disclose that the vanishing point comprises: a quantized value of substantially close to value of `0` ("quantization bands must be zero"; paragraph 66).

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEONARD SAINT CYR whose telephone number is (571) 272-4247. The examiner can normally be reached on Mon- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LS
07/28/08

/Richemond Dorvil/
Supervisory Patent Examiner, Art Unit 2626